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of microscopic technology, and it remained for the authors of the *Enzyklopädie der mikroskopischen Technik*¹ to make the attempt to provide a comprehensive treatise, in which the whole field of microscopic investigation would be adequately treated from the technical standpoint, and in which, in addition, the chemical and physical properties of the countless reagents employed would receive attention.

The first edition of this work appeared in 1903, and the recent publication of a second edition indicates sufficiently well how great was the demand for such a book. This new edition has been the subject of a thorough revision, bringing all articles up to date and adding many new articles and illustrations. At the same time, a number of articles have been dropped, and others so shortened that the new edition only exceeds the first by some 80 pages. The arrangement of the articles is alphabetical, as the title indicates, and in each case the most significant word has been chosen as the initial word of the title of the article on a given topic. Synonyms appear in the proper alphabetical order, reference being made in each case to the name under which the descriptive article may be found. Much help in locating the various methods is also given by the excellent authors' index at the end of the second volume. After each article numerous references are given which help to enhance the value of the work.

It is to be regretted that more attention has not been devoted to microchemical methods. For example, for the microchemical detection of iron in tissues only MACALLUM's older method of treatment with ammonium sulphide receives attention, and no mention is made of his later methods of unmasking organic iron by means of acid alcohol, nor of his methods of distinguishing between organic and inorganic compounds of iron. The methods for the detection of potassium and of chlorides are not considered at all. In a work of such scope, however, it is inevitable that each investigator working in a special field will find certain omissions and defects, but these are of minor importance when one considers the immense wealth of material which the book offers to the working biologist.—R. R. BENSLEY.

Ancient plants

During the last decade paleobotany has become a transformed subject. The development of a technic for the sectioning of fossil plants, and the recognition of the phylogenetic significance of the vascular system have introduced us for the first time to some real knowledge of ancient plants. To the morphologist this new material has been of immense importance, for it has enabled him to check his conclusions as to evolutionary sequence by the records of history. For the general student of botany it has extended his

¹ Enzyklopädie der mikroskopischen Technik. Herausgegeben von EHRLICH, P., KRAUSE, R., MOSSE, M., ROSIN, H., WEIGERT, K. 2. Auflage. Bd. I. pp. 800. Bd. II. pp. 680. Berlin und Wien: Urban & Schwarzenberg. 1910. M 50.

perspective of the plant kingdom enormously. It is high time to present this new field of knowledge to a much larger group than paleobotanists and morphologists, and Miss STOPES has undertaken to do this in her little book entitled "Ancient plants."²

To write such a book is more difficult than to prepare one for special students, for it involves careful selection of material and a simple style. The former always invites the hypercriticism of specialists; and the latter is in danger of sacrificing accuracy to picturesqueness. However, the book is not written for specialists; and extreme accuracy is not so important as vivid impressions. Miss STOPES has certainly succeeded in accomplishing well the task she set for herself. Judgment may vary as to the selections, but this is inevitable; the brevity of treatment has been criticized, but that was a part of the purpose; the attractive and often very picturesque style, even though it might be accused of misleading now and then, is far better for the purpose in mind than a style that flavors of mathematical precision. Such books are intended to arouse interest, and if they stimulate any one to further study, all possible misconceptions will be corrected.

The chapter headings suggest the general treatment: ii, "Various kinds of fossil plants"; iii, "Coal, the most important of plant remains"; iv, "The seven ages of plant life"; v, "Stages in plant evolution"; vi, "Minute structure of fossil plants—likenesses to living ones"; vii, the same—"differences from living ones"; vii-xvii, "Past histories of plant families"; xviii, "Fossil plants as records of ancient countries."

The book can be recommended to all students of botany who should supplement their knowledge of living plants with some information concerning ancient plants. Certainly no student of morphology can afford to neglect the history of his groups, and this little book will serve him well as an introduction.—J. M. C.

NOTES FOR STUDENTS

Mutations in nature.—Mutations probably occur in nature as frequently, in proportion to the percentage of the seeds which succeed in germinating and developing, as in experimental cultures, but actual proof of such mutation must be always wanting. When a single individual of a hitherto unknown type is seen to differ by some marked characteristic from the associated typical individuals of the most closely related species, the natural inference is that the atypic plant is a mutant. If such a plant is found to reproduce its characters in its offspring, such inference is strengthened, but there still remains the question of possible hybridization, and if that can be satisfac-

² STOPES, MARIE C., *Ancient plants; being a simple account of the past vegetation of the earth and of the recent important discoveries made in this realm of nature study.* 8vo. pp. viii+198. *figs.* 122. London: Blackie & Son; and New York: D. Van Nostrand Company. 1910. \$2.00.